



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/753,393	01/09/2004	Takashi Udagawa	Q79052	7899

23373 7590 07/25/2006
SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER

MONDT, JOHANNES P

ART UNIT	PAPER NUMBER
3663	

DATE MAILED: 07/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/753,393	Applicant(s) UDAGAWA, TAKASHI	
	Examiner Johannes P. Mondt	Art Unit 3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 22-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 22, 28 and 30 is/are allowed.
- 6) ☒ Claim(s) 23-27, 29 and 31-42 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination (RCE) under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/16/06 has been entered.

Response to Amendment

Amendment filed 5/16/06 with said RCE has been entered and forms the basis for this office action. In said Amendment applicant substantially amended claims 23, 29 and by inference all other claims dependent thereon, and added new claims 35-42. Comments on Remarks submitted with said Amendment are included below under "Response to Arguments".

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1. ***Claims 23-27, 32, 35, 37 and 41*** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter not described in the specification in such a way

as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention.

In particular, the limitation “wherein the boron phosphide (BP) – based buffer layer is a monolayer” (claim 23) has not been disclosed in the specification and claims as originally filed and hence constitutes new matter. “Monolayer” means “a single or continuous film that is one cell or molecule in thickness” (Merriam-Webster’s Collegiate Dictionary, 10th Edition (1998), page 753).

As a preliminary comment, the buffer layer applicant refers to in Remarks in his discussion of the amendment is a buffer layer in Example 2 illustrated in Figure 2 (first paragraph of page 7 of Remarks). However, this cannot be correct because Figure 2 illustrates Example 1, not Example 2. Moreover, neither Example 1 nor Example 2 disclose or illustrate or otherwise suggest a buffer layer that is a monolayer.

Nor does any part of the specification as originally disclosed. In this regard please note that the thickness of 45 nm referred to in Remarks is far too thick for a BP monolayer, and that, even arguendo despite a lack of disclosure of the combination of aspects as claimed, the lower limit of 5 nm disclosed in the specification, and the discussion of a buffer layer between 1 and about 2 nm (page 11 of the specification), is well over the thickness of a BP monolayer, with a thickness equal to the lattice constant of cubic boron phosphide (BP), which equals 3.615 Å (= 0.3615 nm) (see admission in specification, page 14, line 12; see also O. Madelung, “Semiconductors – Basic Data, page 67) (previously made of record).

2. **Claims 29, 31, 33-34, 36, 38 and 42** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention.

In particular, the limitation “wherein the boron phosphide (BP) – based buffer layer is a monolayer” (claim 29) has not been disclosed in the specification and claims as originally filed and hence constitutes new matter. “Monolayer” means “a single or continuous film that is one cell or molecule in thickness” (Merriam-Webster’s Collegiate Dictionary, 10th Edition (1998), page 753).

As a preliminary comment, the buffer layer applicant refers to in Remarks in his discussion of the amendment is a buffer layer in Example 2 illustrated in Figure 2 (first paragraph of page 7 of Remarks). However, this cannot be correct because Figure 2 illustrates Example 1, not Example 2. Moreover, neither Example 1 nor Example 2 disclose or illustrate or otherwise suggest a buffer layer that is a monolayer.

Nor does any part of the specification as originally disclosed. In this regard please note that the thickness of 45 nm referred to in Remarks is far too thick for a BP monolayer, and that, even arguing despite a lack of disclosure of the combination of aspects as claimed, the lower limit of 5 nm disclosed in the specification, and the discussion of a buffer layer between 1 and about 2 nm (page 11 of the specification), is well over the thickness of a BP monolayer, with a thickness equal to the lattice constant of cubic boron phosphide (BP), which equals 3.615 Å (= 0.3615 nm) (see admission in

Art Unit: 3663

specification, page 14, line 12; see also O. Madelung, "Semiconductors – Basic Data, page 67) (previously made of record).

3. **Claims 39-40** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contain subject matter not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention.

In particular, the limitation "wherein the boron phosphide (BP) – based buffer layer is a monolayer" (claim 39) has not been disclosed in the specification and claims as originally filed and hence constitutes new matter. "Monolayer" means "a single or continuous film that is one cell or molecule in thickness" (Merriam-Webster's Collegiate Dictionary, 10th Edition (1998), page 753).

As a preliminary comment, the buffer layer applicant refers to in Remarks in his discussion of the amendment is a buffer layer in Example 2 illustrated in Figure 2 (first paragraph of page 7 of Remarks). However, this cannot be correct because Figure 2 illustrates Example 1, not Example 2. Moreover, neither Example 1 nor Example 2 disclose or illustrate or otherwise suggest a buffer layer that is a monolayer.

Nor does any part of the specification as originally disclosed. In this regard please note that the thickness of 45 nm referred to in Remarks is far too thick for a BP monolayer, and that, even arguendo despite a lack of disclosure of the combination of aspects as claimed, the lower limit of 5 nm disclosed in the specification, and the discussion of a buffer layer between 1 and about 2 nm (page 11 of the specification),

Art Unit: 3663

overall is well over the thickness of a BP monolayer, with a thickness equal to the lattice constant of cubic boron phosphide (BP), which equals 3.615 Å (= 0.3615 nm) (see admission in specification, page 14, line 12; see also O. Madelung, "Semiconductors – Basic Data, page 67) (previously made of record).

Allowable Subject Matter

4. ***Claims 22, 28 and 30*** are allowed. The following is a statement of reasons for the indication of allowable subject matter: within the context of claim 22 or claim 28, i.e., group-III nitride semiconductor light-emitting device on a single crystal substrate with a buffer layer based on boron phosphide, *the single heterostructure as claimed, i.e., the single heterostructure consisting of a GaInN light emitting layer and a GaNP lower clad layer has not been found in the prior art.*

Response to Arguments

Applicant's arguments filed 5/16/06 have been fully considered but they are not persuasive. All previously rejected claims have been substantially amended, introducing new matter through independent claims 23 and 29, as noted above: nowhere in the specification is disclosed a BP buffer layer that is a monolayer, whether explicitly or by a number for its thickness that agrees with the known lattice constant. All of the previously rejected claims must therefore be rejected for new matter under 35 U.S.C. 112, first paragraph. Furthermore, new claims depend either on said claims 23 or 29, or they depend on allowed claim 22 but also contain the same new matter limitation.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Johannes P. Mondt whose telephone number is 571-272-1919. The examiner can normally be reached on 8:00 - 18:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack W. Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JPM
July 23, 2006

Patent Examiner:

A handwritten signature in black ink, appearing to read 'J. Mondt', with a stylized flourish at the end.

Johannes Mondt (3663).